

Application No. 09/830,480

RXSD 1003-1

In the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) A method for conducting a hearing test using a computer program, comprising:  
establishing a communication channel between an end station and a server in a communication network;  
executing a first portion of the computer program at the server, wherein the first portion of the computer program includes a component to deliver a second portion of the computer program to the end station from a resource coupled to the communication network; and  
executing a the second portion of the computer program at the end station, wherein the second portion of the computer program includes logic executed at the end station that selects stimuli in response to user input and presents the selected stimuli to a user at the end station in accordance with a hearing test protocol.

2. (original) The method of claim 1, wherein the communication network comprises a packet switched network.

3. (currently amended) The method of claim 1, wherein the communication network comprises a network executing according to a standard internet protocol.

4. (original) The method of claim 1, wherein the channel comprises a connection according to a standard transmission control protocol over a standard internet protocol (TCP/IP).

5. (currently amended) The method of claim 4, wherein the second portion of the computer program includes logic that presents a set of stimuli to a user at the end station, and accepts input from the user responsive to the stimuli.

6. (currently amended) A method for conducting a hearing test using a computer program, comprising:

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establishing a communication channel between an end station and a server in a communication network;

executing a first portion of the computer program at the server; and

executing a second portion of the computer program at the end station ~~The method of claim 1,~~ wherein the second portion of the computer program includes logic controlling a sensor at the end station to sense environmental data at the end station during the test.

7. (currently amended) A method for conducting a hearing test using a computer program, comprising:

establishing a communication channel between an end station and a server in a communication network;

executing a first portion of the computer program at the server; and

executing a second portion of the computer program at the end station ~~The method of claim 1,~~ wherein the second portion of the computer program includes logic controlling a sensor at the end station to sense a set up at the end station during the test.

8. (original) The method of claim 1, wherein the computer program includes test control, test data processing, and test sound signal components which are distributed between said first and second portions.

9. (currently amended) The method of claim 1 ~~6~~, wherein the computer program includes a component to deliver the second portion of the computer program to the end station from a resource coupled to the communication network.

10. (original) The method of claim 9, wherein the resource comprises memory at the server.

11. (original) The method of claim 8, wherein the test control component executes a protocol responsive to the test data processing component involving interaction according to the input from the user and the environmental data sensed during the test.

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12. (original) The method of claim 8, wherein the test control component executes a protocol responsive to the test data processing component involving interaction according to the input from the user and the test set up data sensed during the test.

13. (original) The method of claim 5, wherein the second component includes logic driving a graphical user interface to the user in conjunction with the set of stimuli, prompting the user to provide said input.

14. (original) The method of claim 1, wherein the first portion manages presentation of stimuli for the test and the second portion controls production of the stimuli at the end station.

15. (original) The method of claim 1, wherein the hearing test comprises a hearing threshold level test.

16. (original) The method of claim 1, wherein the hearing test comprises a masking threshold level test.

17. (original) The method of claim 1, wherein the hearing test comprises a loudness matching test.

18. (original) The method of claim 1, wherein the hearing test comprises a loudness growth in octave bands LGOB test.

19. (original) The method of claim 1, wherein the hearing test comprises a speech reception threshold and speech discrimination in noise and quiet test.

20. (original) The method of claim 1, wherein the hearing test comprises a temporal compression/expansion/masking test.

21. (original) The method of claim 1, wherein the computer program comprises logic to make measurements to determine actual sound pressure levels of thresholds involved in the test.

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22. (original) The method of claim 1, wherein the computer program comprises logic to make measurements to determine relative sound pressure levels of thresholds involved in the test.

23. (original) The method of claim 1, wherein the end station comprises an internet enabled mobile phone.

24. (original) The method of claim 1, wherein the end station comprises a home computer.

25. (currently amended) The method of claim 1, wherein the end station comprises a hand held computing platform.

26. (original) A method for conducting a hearing test using a computer program, comprising:

linking an user end station to a server using a communication network;

allocating test control and data processing resources, using a communication network, between the user end station and the server;

allocating test sound signal resources to the user end station, using a communication network, the test sound signal resources including logic that selects stimuli and presents the selected stimuli to a user at the end station in accordance with a hearing test protocol, and accepts input from the user responsive to the stimuli;

generating a sound using the test sound signal resource;

accepting and processing input using the test control and data processing resources;

determining a status of a test according to a test protocol, and if the test is done, then storing a hearing profile for the user, and if the test is not done, then determining a next stimulus according to the test protocol using the test control resources, and returning to the step of generating a sound.

27. (original) The method of claim 26, wherein the communication network comprises a packet switched network.

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28. (currently amended) The method of claim 26, wherein the communication network comprises a network executing according to a standard internet protocol.

29. (original) The method of claim 26, wherein the channel comprises a connection according to a standard transmission control protocol over a standard internet protocol (TCP/IP).

30. (currently amended) The method of claim 26, ~~wherein~~ including logic controlling a sensor at the end station to sense environmental data at the end station during the test.

31. (original) The method of claim 30, wherein the test control resources execute a test protocol responsive to the test data processing resources involving interaction according to input from the user and the environmental data sensed during the test.

32. (original) The method of claim 30, wherein the set of stimuli includes audio stimuli, and the environmental data comprises background noise.

33. (currently amended) The method of claim 26, ~~wherein~~ including logic controlling a sensor at the end station to sense test set up data at the end station during the test.

34. (original) The method of claim 33, wherein the test control resources execute a test protocol responsive to the test data processing resources involving interaction according to input from the user and the test set up data sensed during the test.

35. (original) The method of claim 26, including logic driving a graphical user interface in conjunction with generating the sound, which prompts the user to provide input.

36. (original) The method of claim 26, wherein the end station comprises an internet enabled mobile phone.

37. (original) The method of claim 26, wherein the end station comprises a home computer.

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38. (original) The method of claim 26, wherein the end station comprises a hand held computing platform.

39. (currently amended) A method for conducting a hearing test using a computer program, comprising:

establishing a communication channel between an end station and a server in a communication network;

executing a first portion of the computer program at the server, wherein the first portion of the computer program includes a component to deliver a second portion of the computer program to the end station from a resource coupled to the communication network;

executing a the second portion of the computer program at the end station, wherein the end station includes sound processing resources for producing audio signals during the test; and wherein the second portion includes logic for calibrating the sound processing resources.

40. (original) The method of claim 39, wherein the communication network comprises a packet switched network.

41. (original) The method of claim 39, wherein the communication network comprises a network executing according a standard internet protocol.

42. (original) The method of claim 39, wherein the channel comprises a connection according to a standard transmission control protocol over a standard internet protocol (TCP/IP).

43. (original) The method of claim 39, wherein the second portion of the computer program includes logic that presents a set of stimuli to a user at the end station, and accepts input from the user responsive to the stimuli.

44. (original) The method of claim 39, wherein the second portion of the computer program includes logic controlling a sensor at the end station to sense environmental data at the end station during the test.

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45. (original) The method of claim 39, wherein the second portion of the computer program includes logic controlling a sensor at the end station to sense a set up at the end station during the test.

46. (original) The method of claim 39, wherein the computer program includes test control, test data processing, and test sound signal components which are distributed between said first and second portions.

47. (original) The method of claim 39, wherein the computer program includes a component to deliver the second portion of the computer program to the end station from a resource coupled to the communication network.

48. (original) The method of claim 47, wherein the resource comprises memory at the server.

49. (original) The method of claim 46, wherein the test control component executes a protocol responsive to the test data processing component involving interaction according to the input from the user and the environmental data sensed during the test.

50. (original) The method of claim 46, wherein the test control component executes a protocol responsive to the test data processing component involving interaction according to the input from the user and the test set up data sensed during the test.

51. (original) The method of claim 43, wherein the second component includes logic driving a graphical user interface to the user in conjunction with the set of stimuli, prompting the user to provide said input.

52. (original) The method of claim 39, wherein the first portion manages presentation of stimuli for the test and the second portion controls production of the stimuli at the end station.

53. (original) The method of claim 39, wherein the hearing test comprises a hearing threshold level test.

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54. (original) The method of claim 39, wherein the hearing test comprises a masking threshold level test.

55. (original) The method of claim 39, wherein the hearing test comprises a loudness matching test.

56. (original) The method of claim 39, wherein the hearing test comprises a loudness growth in octave bands LGOB test.

57. (original) The method of claim 39, wherein the hearing test comprises a speech reception threshold and speech discrimination in noise and quiet test.

58. (original) The method of claim 39, wherein the hearing test comprises a temporal compression/expansion/masking test.

59. (original) The method of claim 39, wherein the computer program comprises logic to make measurements to determine actual sound pressure levels of thresholds involved in the test.

60. (original) The method of claim 39, wherein the computer program comprises logic to make measurements to determine relative sound pressure levels of thresholds involved in the test.

61. (original) The method of claim 39, wherein the end station comprises an internet enabled mobile phone.

62. (original) The method of claim 39, wherein the end station comprises a home computer.

63. (currently amended) The method of claim 39, wherein the end station comprises a hand held computing platform.



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64. (original) The method of claim 39, wherein said calibrating includes:  
determining an input transfer function and an output transfer function for the sound  
processing resources.

65. (original) The method of claim 39, wherein said calibrating includes:  
electronically determining an input transfer function and an output transfer function for  
the sound processing resources.

66. (currently amended) ~~The method of claim 39,~~ A method for conducting a hearing test  
using a computer program, comprising:

establishing a communication channel between an end station and a server in a  
communication network;

executing a first portion of the computer program at the server;

executing a the second portion of the computer program at the end station, wherein the  
end station includes sound processing resources for producing audio signals during the test; and

calibrating the sound processing resources, wherein said sound processing resources have  
an electronic input adapted to receive analog voltage inputs representative of sound, and first and  
second electronic outputs adapted to supply analog voltages representative of sound, and wherein  
said calibrating includes:

coupling a calibration device to the electronic input and the first and second electronic  
outputs of the sound processing resources; and

using the calibration device to supply a test signal to the electronic input, and feeding  
back a processed signal output on one of the first and second electronic outputs to the electronic  
input.

67. (original) The method of claim 66, including supplying control signals to the  
calibration device using the other of the first and second electronic outputs.

68. (original) The method of claim 67, wherein the control signals comprise dual tone  
multi-frequency DTMF signals.

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69. (original) The method of claim 66, wherein the test signal comprises a tone, and including determining an input transfer function in response to the tone, and then generating the processed signal using the sound processing resources and determining an output transfer function in response to the processed signal and the input transfer function.

70. (currently amended) The method of claim 66, wherein the test signal comprises an output of a voltage controlled oscillator, and including using a signal from the sound processing resources to control the voltage controlled oscillator, and determining an output transfer function in ~~reponse~~ response to the test signal, and determining an input transfer function in response to the processed signal and the output transfer function.

71. (currently amended) An apparatus for calibrating sound processing resources on an end station using a program executed by the [[an]] end station, comprising:

- a test signal source;
- a first input adapted to receive electronic inputs representative of sounds from a first output of the sound processing resources;
- a second input adapted to receive electronic inputs representative of sounds from a second output of the sound processing resources;
- an output adapted to provide electronic outputs representative of sounds to a first input of the sound processing resources; and
- a switch to connect the test signal source to the output, and to connect one of the first and second inputs to the output in response to control signals.

72. (original) The apparatus of claim 71, wherein the test signal source comprises a tone generator adapted for connection to the output for use in measuring an input transfer function of the sound processing resources.

73. (original) The apparatus of claim 71, wherein the test signal source comprises a voltage controlled oscillator, having a control input adapted to be connected to one of the first and second inputs, and to supply a signal to the output for use in measuring an output transfer function of the sound processing resources.

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74. (original) The apparatus of claim 71, including a circuit supplying signals from one of the first and second inputs as the control signals for the switch.

75. (original) The apparatus of claim 74, wherein the signals from the one of the first and second inputs comprise dual tone multi-frequency DTMF signals.

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